Review Article

Pathophysiology of a scientific paper

ABSTRACT

Scientific paper writing for science journals is highly adroit, competitive, and laborious process. Scientific writing has a constant design, which is confounding for apprentice science writers. The huge amount of impediments is associated with scientific writing which may be reduced by applying some practices and guidelines. The basic structure of scientific articles mainly comprises of the title, abstract, keywords, introduction, methods, results, discussion, conclusion, acknowledgments, and references. The pathophysiological aspects which minimize the chances of publication of an academic paper are rarely discussed in the literature. Early career of physicians and researchers is not well acquainted with the components of scientific paper. This study established an approach to understand the basic characteristics of pathophysiology of scientific writing.

Key words: Pathophysiology; science and technology; scientific writing; writing tips

In this modern era of science and technology, scientific writing is gaining popularity among undergraduate, postgraduate students, physicians, and research scholars who are fascinated in a profession as an academic scientist.[1] Research paper writers understand the basic scientific writing skills[1,2] as it is vital to comprehend the anatomy and physiology of the various sections of the scientific paper. This article highlights the pathophysiological characteristics which should be avoided while writing the various sections of the scientific paper.

Title

The title is an extremely imperative section of an academic article. This is the first fragment that an editor, reviewer and reader reads, which helps comprehend the contents of the scientific paper. It gives the first impression to the readers about the article and makes him decide to either read it or leave it. The main pathophysiological characteristics, which minimize the importance of the title, are being too difficult to understand, not easy to catalogue and fascinate the readers.[3] If it is too long, too short, unclear, or humorous, the title dilutes the strength of the study. The large, unspecific title with abbreviations does not convey the main idea to readers.[4,5] A poor title does not comprise of the basic key words, which reflects the core contents of the article. "A poor title is like a quarantine sign; the readers read it and go away"[3] The title must be simple, small, and explicit without any abbreviations and biased representation [Table 1].[3]

Abstract

The abstract is the very vital part of the scientific manuscript. The readers frequently read the abstract and decide to read the article or move on. A clear, concise, short and expressive abstract serves as a core for the manuscript.[6] A well-written abstract sets the tone for the article and develops an interest among the readers to read it and describes the evidence

Access this article online

Website: www.saudija.org

Quick Response Code

DOI: 10.4103/sja.SJA_48_19

How to cite this article: Meo SA, Eldawlatly AA. Pathophysiology of a scientific paper. Saudi J Anaesth 2019;13:S9-11.

Sultan Ayoub Meo, Abdelazeem A. Eldawlatly[1]

Departments of Physiology and [1]Anesthesia, College of Medicine, King Saud University, Riyadh, Saudi Arabia

Address for correspondence: Prof. Sultan Ayoub Meo, Department of Physiology, College of Medicine, King Saud University, Riyadh, Saudi Arabia. E-mail: sultanmeo@hotmail.com

from the segments of the article using a summary of the background, methods, results, and conclusions.[7] The main pathophysiological features of an abstract are failing to describe the major findings of the article. A short abstract with insufficient information and a lengthy abstract with unnecessary details or unclear ideas are the major drawbacks of the poor abstract. These often confuse the readers, and they stop reading the article, giving it a miss [Table 1].

Introduction

The introduction section of the paper is indispensable in telling the targeted audience about the reason for conducting this study. It is vital to elaborate the allied research literature and recapitulate the understanding of the gaps. An author should talk about the literature, objective of the study in the form of a hypothesis, questions, or problems investigated and should give a brief and rational explanation. It is essential to recognize these key topics that the study deals with.[8] The introduction section of the scientific article begins with ascertaining the area of interest, and focuses on the topic. The introduction section of the scientific paper is like an entrance gate of a scholarly city. A good introduction attracts the attention of readers, whereas, poor introduction misleads them.[9]

Methods

The method section is the most important part on which the excellence of the article is grounded. It allows the learners to understand the basic methodological aspects of the study and this section also provides information on which the study's validity is judged.[10] It contains evidence to enable the readers to understand "what was done, where it was done, and how it was done".[11] The study "design, settings, control, exposed or treatment groups and variables measured" should be discussed stepwise in the methods section. It is also essential to provide the "study protocol, inclusion and exclusion criteria, sample size", grouping,[11] materials, equipment, data collection, experimental handling, measurements and procedures. A poor method section fails to provide this crucial information [Table 1].

Results

The results section is the core of an academic paper for reporting the data to justify the conclusions.[11] This section, emphasizes the major findings in a balanced progression, reports both negative and positive findings, organizes the data in tabular or illustration format and provides associations, variances and magnitude of the findings with adequate interpretation. It is crucial to avoid discussing or

Table 1: Pathophysiological features in various sections of a research article

Title	Abstract
Too small or too lengthy	Too short or too long
Ambiguous	Contains over 300 words
Unable to attract the readers	Missing important information
Too difficult to cognize	Fails to summarize main findings
Not easy to catalogue	Fails to follow structured or unstructured pattern
Poor description of the manuscript	Citing reference
Contains abbreviations	
Introduction	Methods
Unable to identify the subject area	Fails to discuss study design and settings
Poor settings	No inclusion and exclusion criteria
Irrelevant literature	No description of sample size and groupings
Unable to summarize the existing problems	No description of measuring tools
Unable to discuss the hypothesis and problems	No statistical tools description
Fails to clarify rationale and gaps	No Ethical statement
Poor citations with old references	Poor data analysis
Results	Discussion
Fails to provide key findings	Fails to answer to testable hypotheses
Reports only positive findings	No description of results with other's findings
Unable to report negative results	No discussion of contradictory findings
Unable to discuss differences and relationships	No alternative explanations
Poor description of "significant" and "non-significant" findings	Discussion of prior work without references
Lengthy analysis and duplication of information	No discussion of study strengths & limitations
Conclusions	Declaration
Too concise and not clear	Poor acknowledgement
No reporting of principal findings	No declaration of ethical statement
Highlighting unproven findings	No declaration of conflicts of statement
No accuracy	No declaration of study funding
Vague and biased	No declaration of any association with journal etc.,
No satisfying ending	

Avoid all above pathophysiological features while writing the various sections of the scientific paper

interpreting the results reporting background information to explain the findings.[11] The results section should include both text and illustrations to provide better understanding of the theme.

Discussion

The discussion piece is the most important component of the scientific paper, it provides clarifications on synthesis of the findings and issues. This section should start with the obtainable main study findings, and should debate the results with the findings of others for providing enough interpretations. The author discusses the contrary findings with explanations and reliable reasons using the standard references. The discussion section should be like an inverted pyramid, from general to specific, and it should relate the findings with that to the literature. Before concluding the discussion, the study's potential strengths and limitations should be identified.[12]

Conclusion

The conclusion is the most significant and last part of the scientific paper, it must summarize the entire article as it is what readers always recall. The conclusion section must cover the principal findings and should be considered as the take-home message. The authors provide factual scientific justification and suggestions. The conclusion section should contain an enjoyable ending to the reader's utmost satisfaction.

To understand the pathophysiological aspects in the various sections of the scientific paper, it is essential to identify the basic characteristics, structure and functions of an academic article. The author(s) also understand the pathophysiological processes in the various sections of the scientific paper that minimize the chances of publication of the scientific paper. The researchers must learn the art and science of the scientific paper writing.

Acknowledgements

Thankful to the "College of Medicine Research Centre and Deanship of Scientific Research, King Saud University, Riyadh, Saudi Arabia".

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. McDonnell JJ. Paper writing gone Hollywood. Science 2017;355:102.
2. Bajwa SJ, Sawhney C. Preparing manuscript: Scientific writing for publication. Indian J Anaesth 2016;60:674-8.
3. Meo SA, Al-Saadi MM. Right path of publishing a scientific paper to a right journal: Academic paper based case study. Pak J Med Sci 2007;23:946-9.
4. Bowman D, Kinnan S. Creating effective titles for your scientific publications. VideoGIE 2018;3:260-1.
5. Cook DA, Bordage G. Twelve tips on writing abstracts and titles: How to get people to use and cite your work. Med Teach 2016;38:1100-4.
6. Goodman D, Ogrinc G, Davies L, Baker GR, Barnsteiner J, Foster TC. Explanation and elaboration of the SQUIRE (Standards for Quality Improvement Reporting Excellence) Guidelines: Examples of SQUIRE elements in the healthcare improvement literature. BMJ Qual Saf 2016;25:e7.
7. Ogrinc G, Davies L, Goodman D, Batalden P, Davidoff F, Stevens D. Standards for quality improvement reporting excellence 2.0: Revised publication guidelines from a detailed consensus process. J Surg Res 2016;200:676-82.
8. Cals JW, Kotz D. Effective writing and publishing scientific papers, part III: Introduction. J Clin Epidemiol 2013;66:702.
9. Abdullah A. How to write an introduction section of a scientific article? Turk J Urol 2013;39(Suppl 1):8-9.
10. Kallet RH. How to write the methods section of a research paper. Respir Care 2004;49:1229-32.
11. Meo SA. Anatomy and physiology of a scientific paper. Saudi J Biol Sci 2018;25:1278-83.
12. Hess DR. How to write an effective discussion. Respir Care 2004;49:1238-41.